Co-Laboratory

Advanced Distributed Learning

SM

Alexandria ★ Orlando ★ Wisconsin

Vision:

www.adlnet.org

Provide access to the highest quality education and training, tailored to individual needs, delivered cost-effectivly, anywhere and anytime.

Magnitude of Education & Training in DoD

- Addresses the needs of 2.5 million military personnel, DoD civilians, and their dependents

- Includes approximately 30,000 military training courses

- Costs about $17 billion annually to operate and maintain military schools

- Involves career-long learning: recruit, basic, advanced, professional development, and education

- Encompasses a broad range of technical and decision making skills for both individuals and teams

Vision: www.adlnet.org

Provide access to the highest quality education and training, tailored to individual needs, delivered cost-effectivly, anywhere and anytime.

ADL Co-Laboratories

An open collaborative environment for sharing learning technology research, development, and assessments. The Co-Lab goals are to:
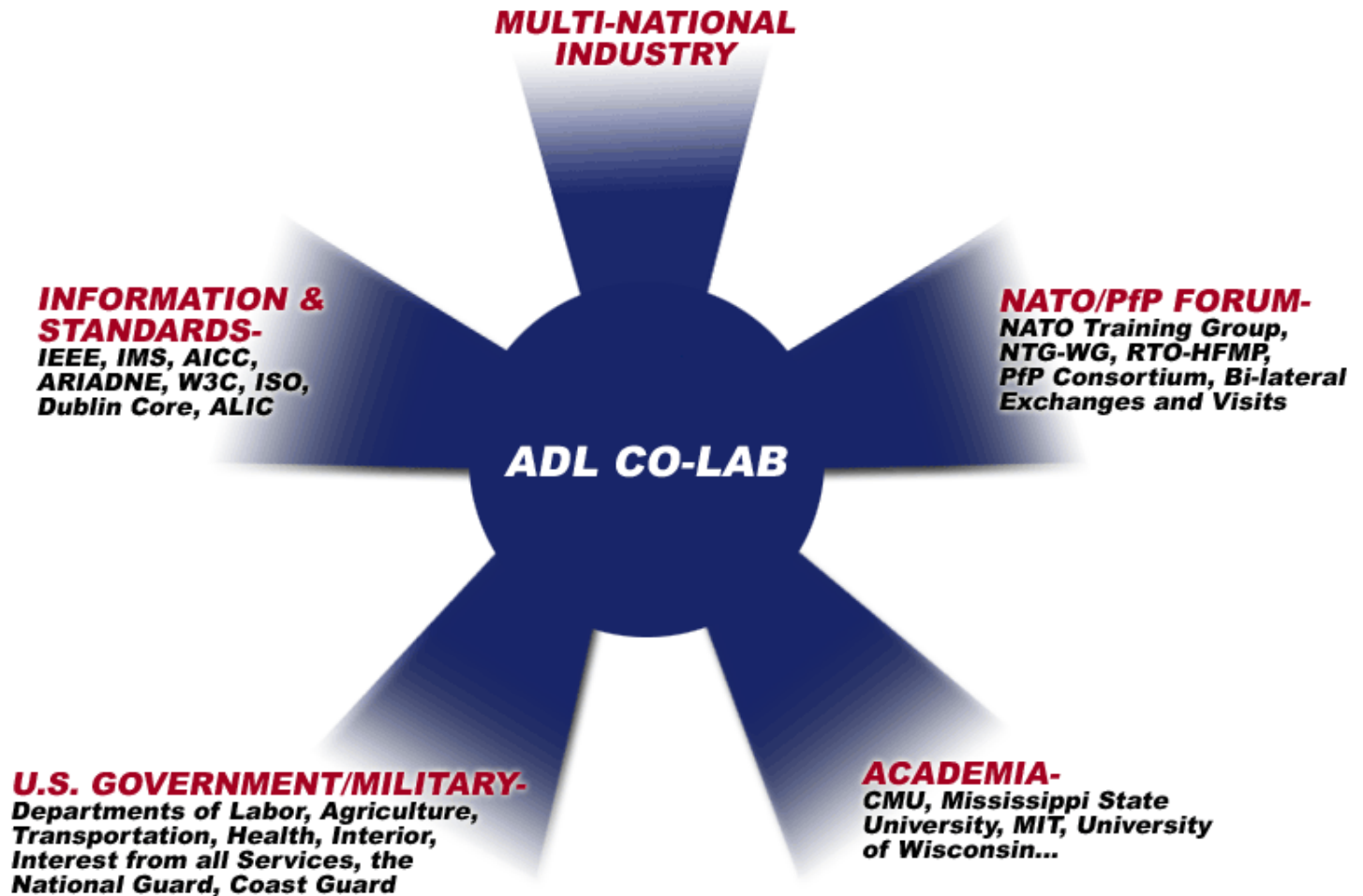
- Develop and refine the SCORM
- Assess ADL tools and prototypes
- Facilitate collaborative resource sharing
- Collect and disseminate data and lessons learned
- Conduct tutorials and demonstrations
- Support and advise federal, state, and local agencies, and private-sector partners

Vision: www.adlnet.org

Provide access to the highest quality education and training, tailored to individual needs, delivered cost-effectivly, anywhere and anytime.

ADL Communities

MULTI-NATIONAL INDUSTRY

INFORMATION & STANDARDS-
IEEE, IMS, AICC, ARIADNE, W3C, ISO, Dublin Core, ALIC

NATO/PfP FORUM-
NATO Training Group, NTG-WG, RTO-HFMP, PfP Consortium, Bi-lateral Exchanges and Visits

ADL CO-LAB

U.S. GOVERNMENT/MILITARY-
Departments of Labor, Agriculture, Transportation, Health, Interior, Interest from all Services, the National Guard, Coast Guard

ACADEMIA-
CMU, Mississippi State University, MIT, University of Wisconsin...

Vision:

www.adlnet.org
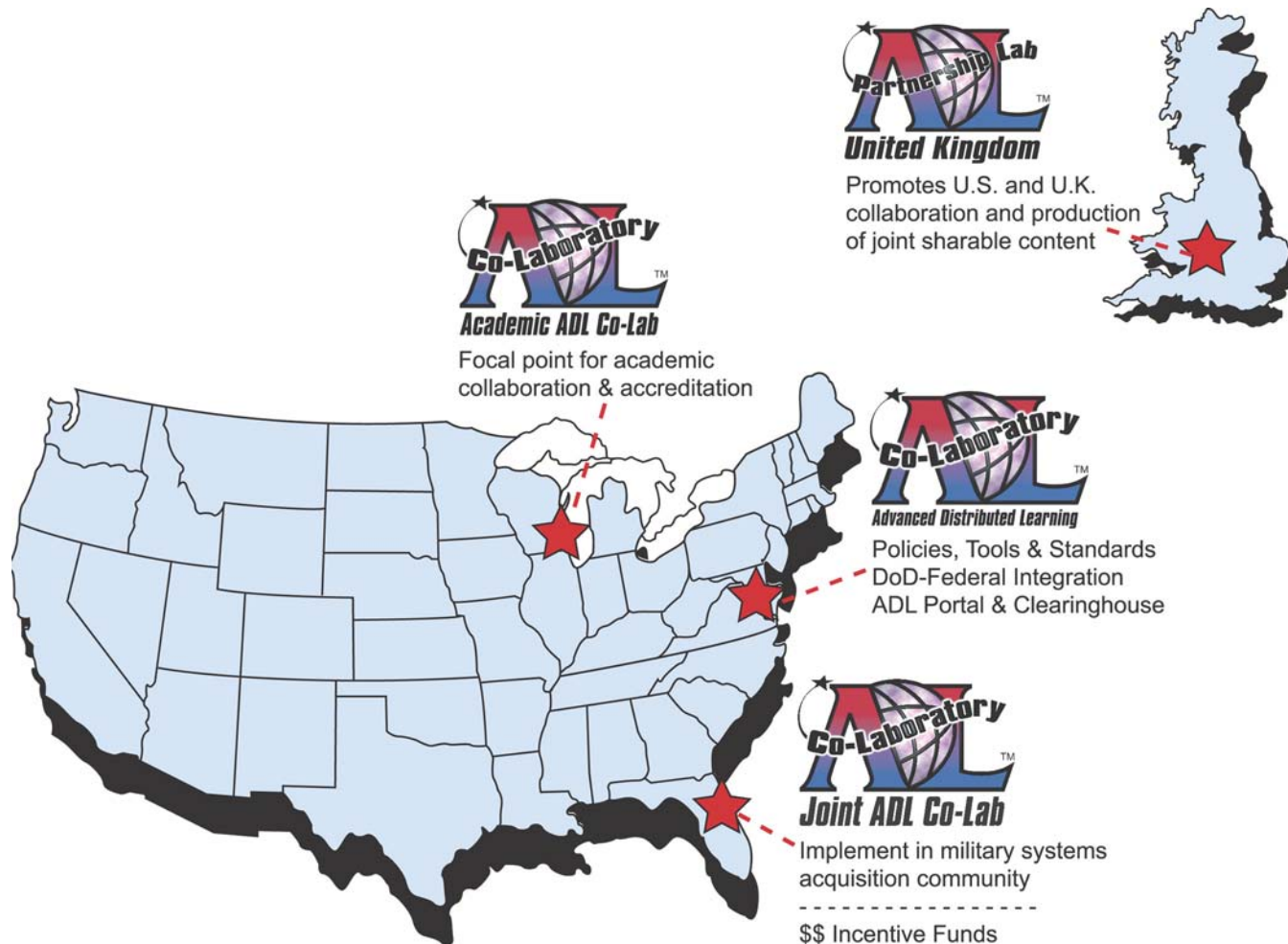
Provide access to the highest quality education and training, tailored to individual needs, delivered cost-effectivly, anywhere and anytime.
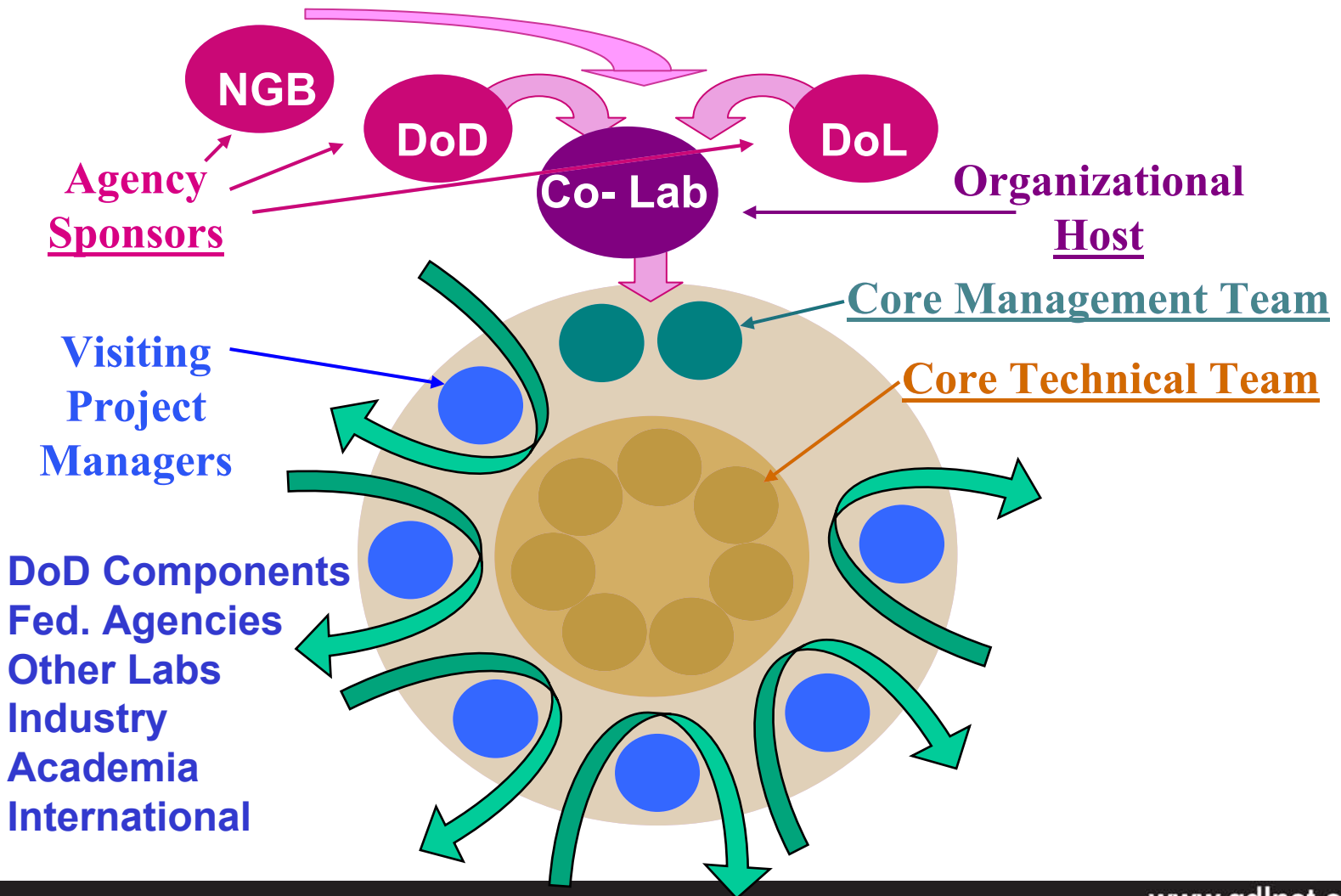
ADL Co-Labs and Partnership Lab

Partnership Lab
United Kingdom
Promotes U.S. and U.K. collaboration and production of joint sharable content

Co-Laboratory
Academic ADL Co-Lab
Focal point for academic collaboration & accreditation

Co-Laboratory
Advanced Distributed Learning
Policies, Tools & Standards
DoD-Federal Integration
ADL Portal & Clearinghouse

Co-Laboratory
Joint ADL Co-Lab
Implement in military systems acquisition community
- - - - - - - - - - - - - - - - -
$$ Incentive Funds

Vision:

www.adlnet.org

Provide access to the highest quality education and training, tailored to individual needs, delivered cost-effectivly, anywhere and anytime.

Collaborative Process

NGB

DoD

DoL

Co- Lab

Agency Sponsors

Organizational Host

Core Management Team

Visiting Project Managers

Core Technical Team

DoD Components
Fed. Agencies
Other Labs
Industry
Academia
International

Vision: Provide access to the highest quality education and training, tailored to individual needs, delivered cost-effectivly, anywhere and anytime.

Government Organizations working with ADL

- **Employment and Training Administration (ETA-DoL)**
- **Office of Policy (DoL)**
- **Mine Safety Health Agency (MSHA-DoL)**
- **National Guard Bureau (NGB)**
- **Center for Disease Control (CDC)**
- **Internal Revenue Service (IRS)**
- **United States Postal Service (USPS)**
- **National Aeronautic Space Agency (NASA)**
- **Department of Agriculture, Graduate School**
- **Department of Justice (DoJ)**
- **Department of Education (DoEd)**
- **Department of Interior, Bureau of Land Management**
- **Department of Treasury, Office of the Comptroller Currency**
- **Veterans Administration (VA)**

Vision: www.adlnet.org

Provide access to the highest quality education and training, tailored to individual needs, delivered cost-effectivly, anywhere and anytime.

Collaboration on the Development of Technical Learning Standards

Web-based Learning Content Issues

- What problems are we are trying to solve?

- Can't move a web-based course from one Learning Management System (server) to another

- Can't reuse web-based content pieces (objects) across different LMS systems

- Can't create searchable learning content libraries or media repositories across different LMS environments

(among others…)

Vision:

www.adlnet.org

Provide access to the highest quality education and training, tailored to individual needs, delivered cost-effectivly, anywhere and anytime.

ADL's Role

- Distributed web-based learning lacked a common architecture and was not interoperable
- Since industry and consortia weren't converging, ADL took a leadership role:
- Building consensus among users, developers and industry
- Acting as a catalyst to bring together key players
- Forging alliances in strategic technical areas
- Accelerating the pace of technology adoption for learning anytime, anywhere

  - "enlightened self-interest" at work

Vision: www.adlnet.org

Provide access to the highest quality education and training, tailored to individual needs, delivered cost-effectivly, anywhere and anytime.

SCORM™

Sharable Content Object
Reference Model

A software model that defines the interrelationship of course components, data models, and protocols such that content "objects" are sharable across systems that conform with the same model.

Vision:

www.adlnet.org

Provide access to the highest quality education and training, tailored to individual needs, delivered cost-effectivly, anywhere and anytime.
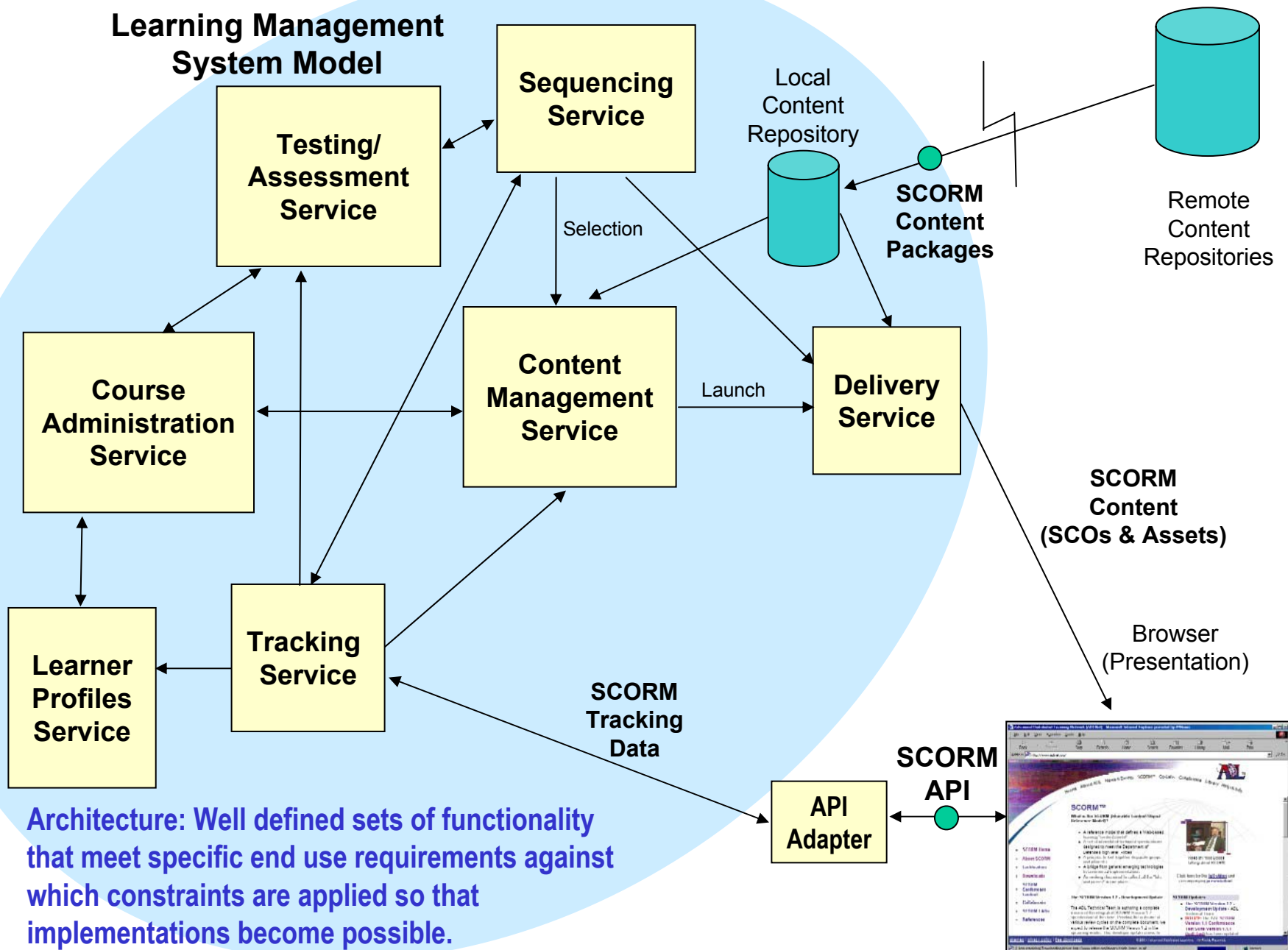
What SCORM Is

SCORM = "Sharable Content Object Reference Model"

- A Reference Model that defines how to implement distributed learning systems in a common way
- A set of specifications developed with industry and combined into a set of ADL "Best Practices" that enable:
  - Sharable, reusable, searchable learning content
  - Directed, "adaptive" learning experiences
- A means to provide for conformance testing and uniform implementation by industry
- An ongoing consensus process with industry and academia
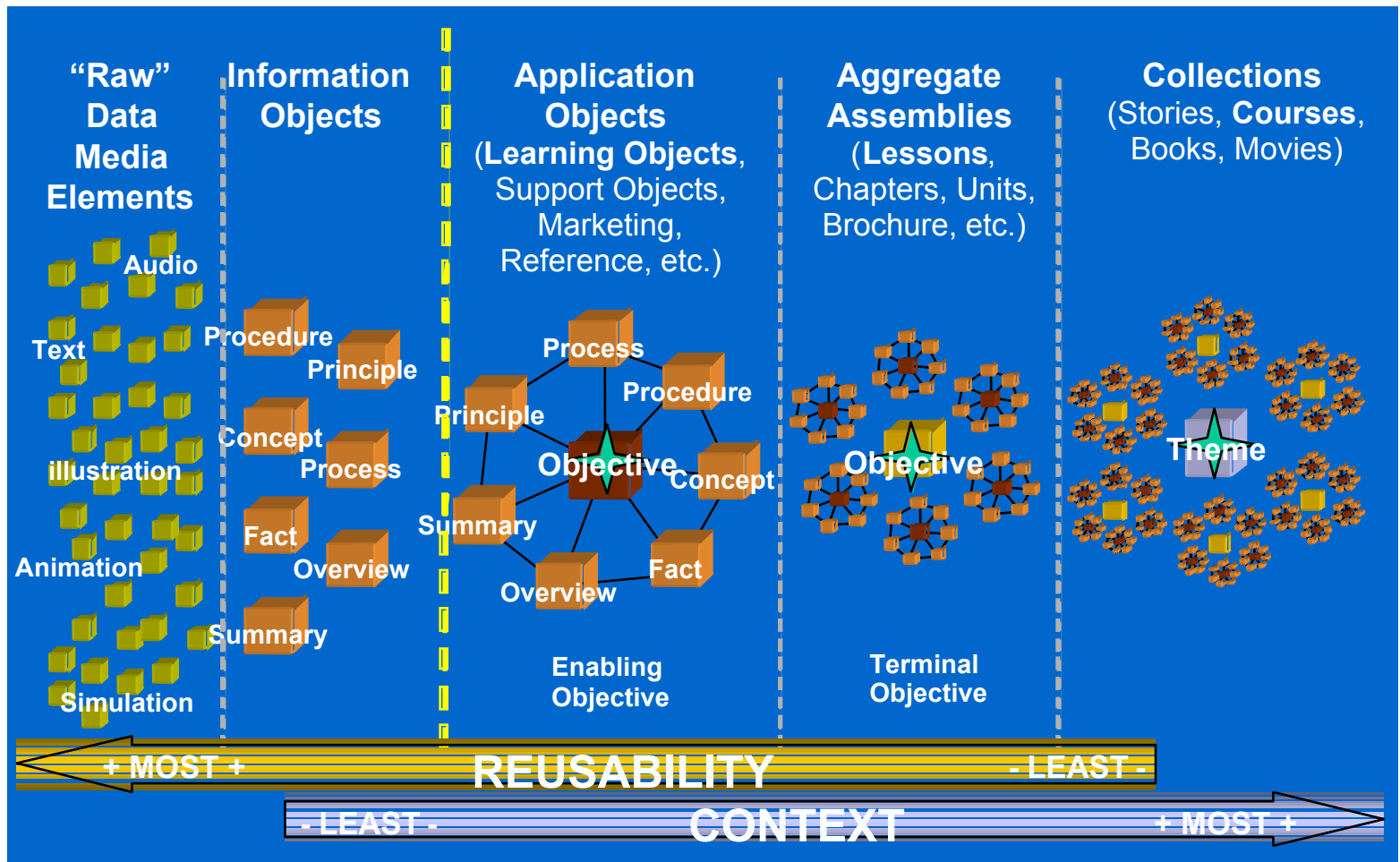- An accelerator of uniform practice

Vision: www.adlnet.org

Provide access to the highest quality education and training, tailored to individual needs, delivered cost-effectivly, anywhere and anytime.

**Generalized
Learning Management
System Model**

**Sequencing
Service**

Local
Content
Repository

**Testing/
Assessment
Service**

Selection

**SCORM
Content
Packages**

Remote
Content
Repositories

**Course
Administration
Service**

**Content
Management
Service**

Launch

**Delivery
Service**

**SCORM
Content
(SCOs & Assets)**

**Tracking
Service**

Browser
(Presentation)

**Learner
Profiles
Service**

**SCORM
Tracking
Data**

**SCORM
API**

**API
Adapter**

Architecture: Well defined sets of functionality
that meet specific end use requirements against
which constraints are applied so that
implementations become possible.
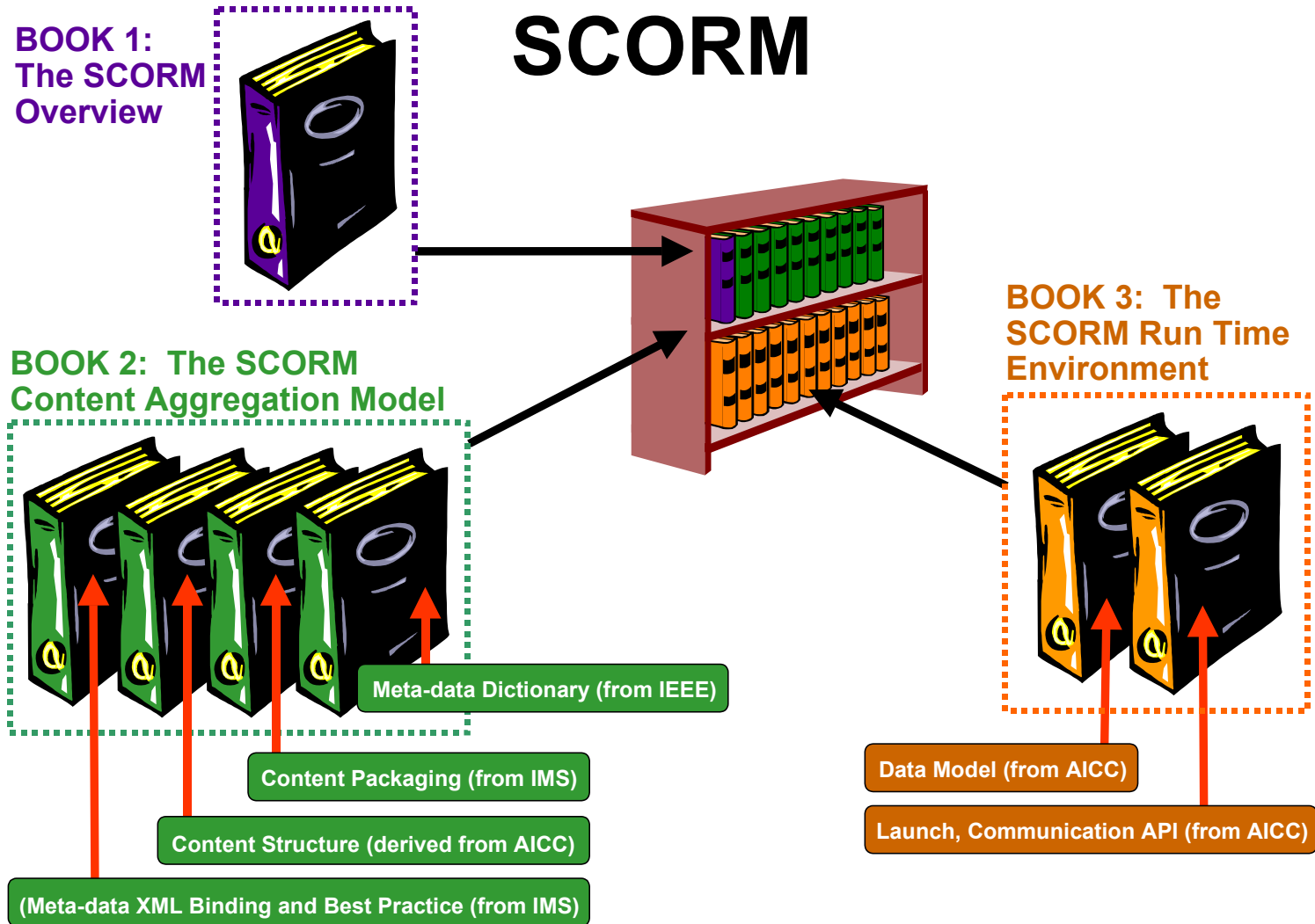
Reusable Learning Objects

Source: Autodesk

Vision: www.adlnet.org

Provide access to the highest quality education and training, tailored to individual needs, delivered cost-effectivly, anywhere and anytime.

SCORM

**BOOK 1:
The SCORM Overview**

**BOOK 2: The SCORM
Content Aggregation Model**

**BOOK 3: The
SCORM Run Time
Environment**

Meta-data Dictionary (from IEEE)

Content Packaging (from IMS)

Content Structure (derived from AICC)

(Meta-data XML Binding and Best Practice (from IMS)

Data Model (from AICC)

Launch, Communication API (from AICC)

Vision: www.adlnet.org

Provide access to the highest quality education and training, tailored to individual needs, delivered cost-effectivly, anywhere and anytime.

SCORM 1.3

- SCORM 1.3 is enabling capabilities that haven't been standardized before
- First industry agreed-to XML representation for sequencing learning objects
  - Rule-based ("if mastered then skip next")
- Current Architecture constraints:
  - Distributed (web) delivery in a browser
  - Content must be movable/reusable (objects)
  - Instructional Design strategies are "exposed" (open)
  - Learner is tracked; results affect learning experience

Vision: www.adlnet.org

Provide access to the highest quality education and training, tailored to individual needs, delivered cost-effectivly, anywhere and anytime.

Five Year Progress Report

1998 Conditions	2003 Conditions
No interoperable eLearning content standards	SCORM 1.2, tested and with conformance test software; 1.3 Sample RTE Version 1.3 Beta-2
No standards group agreement (AICC, IEEE, IMS, ARIADNE, etc).	ADL brokered agreement on process and flow among all groups
No industry consensus	Strong SCORM support by industry (e.g., Plugfest 7)
Concern and suspicion about ADL Initiative and DoD motives	Support for ADL leadership and SCORM process in particular
No advanced work on next generation architectures	ADL Funded/supported key research at CMU; now harmonizing with MIT OKI work
ADL's role unclear to many	ADL viewed as "key" accelerator/catalyst

Vision: www.adlnet.org

Provide access to the highest quality education and training, tailored to individual needs, delivered cost-effectivly, anywhere and anytime.

AICC + IEEE + IMS + ADL = SCORM
Many, many long technical meetings

IEEE Meetings
Late 1999
Partial list of participants:
Microsoft
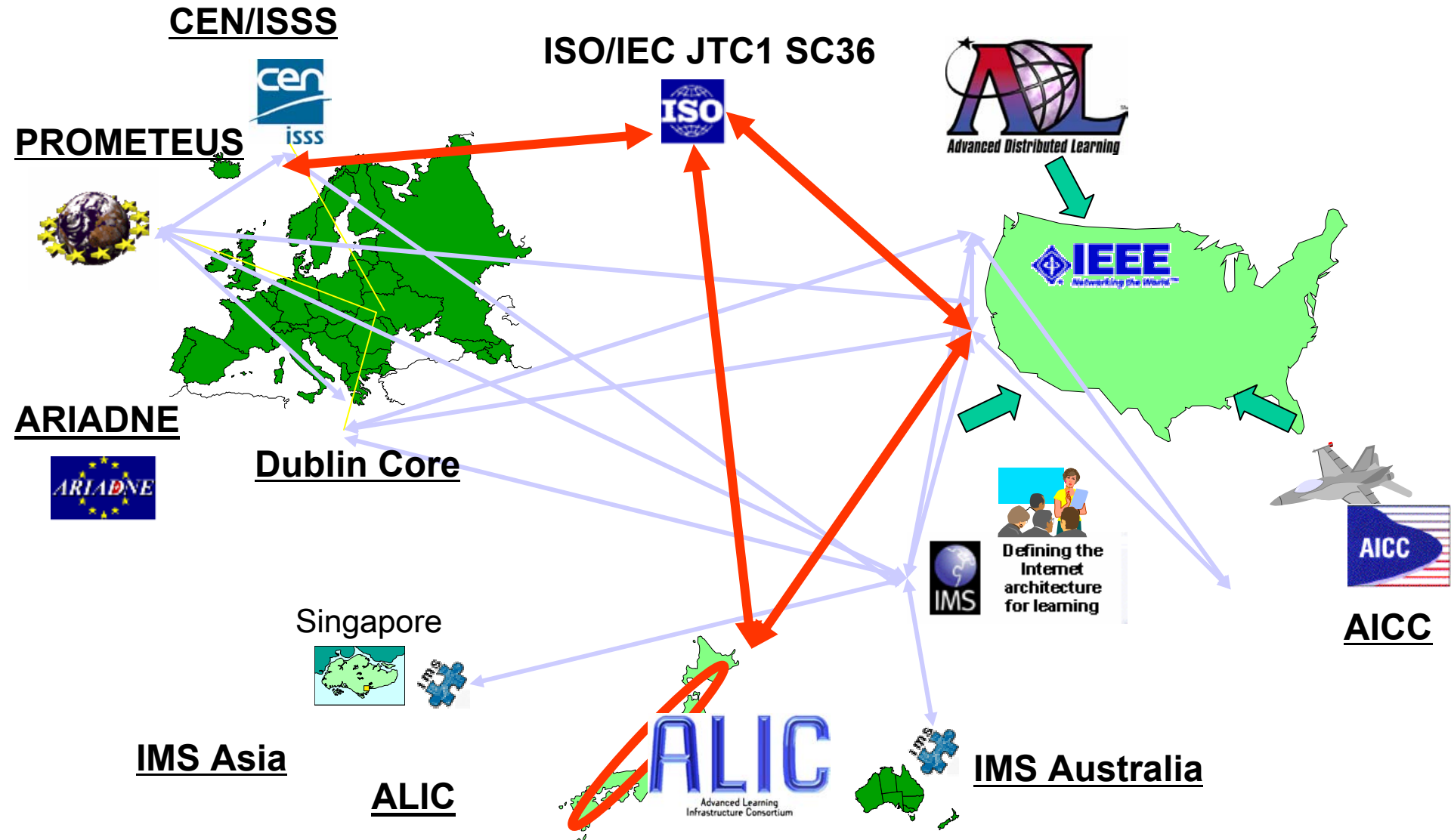*Sun*
Boeing
Oracle
Cisco
IBM

Click2Learn, Avilar, Pathlore,
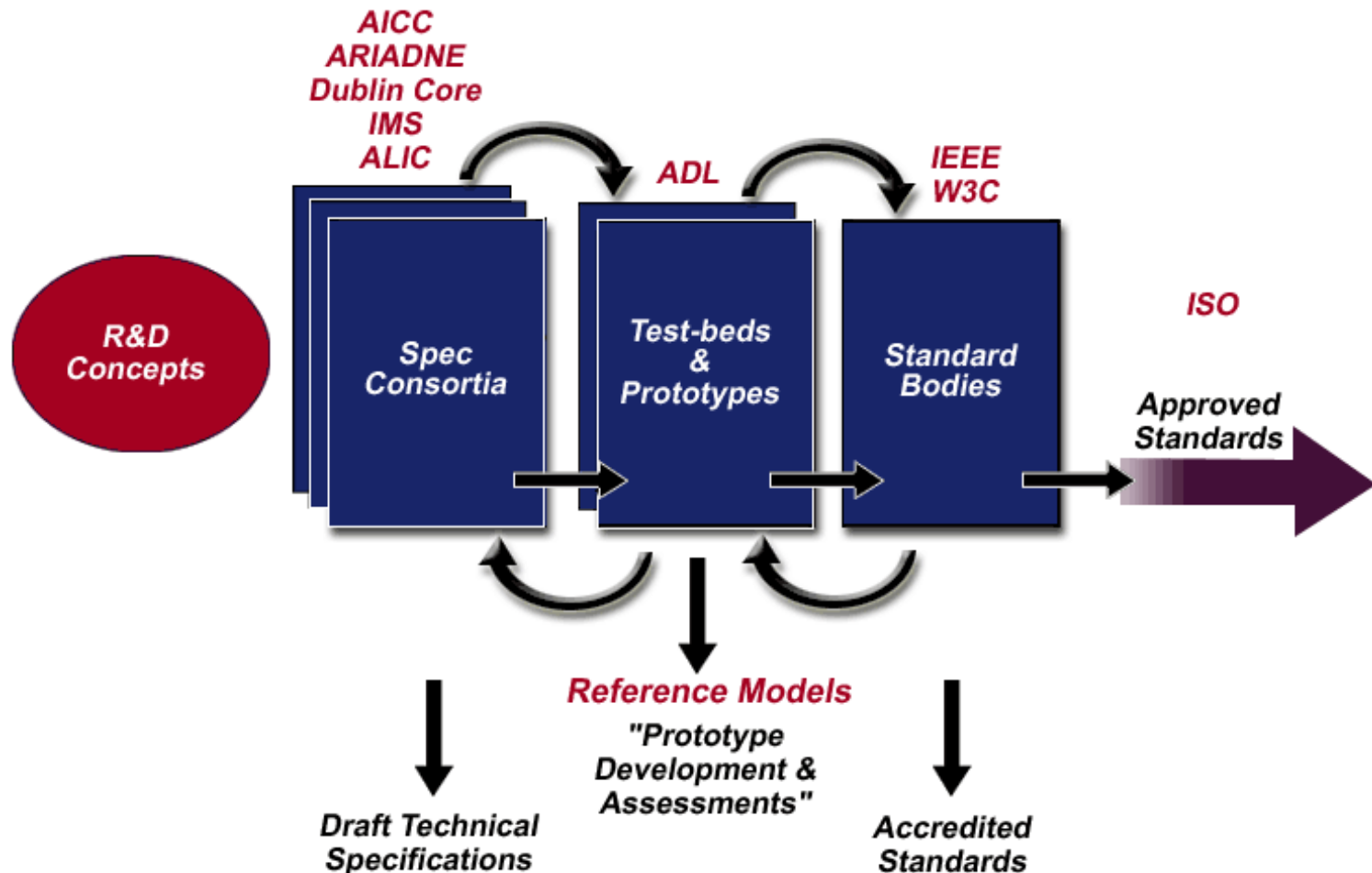*Saba, NETg, SmartForce,*
Centra, Thinq, Macromedia,
and many more…

IMS Meetings
Early 2000

Resulting in a World Wide Community for Learning Technology

CEN/ISSS

ISO/IEC JTC1 SC36

PROMETEUS

ARIADNE

Dublin Core

Singapore

IMS Asia

ALIC

Advanced Learning Infrastructure Consortium

IMS Australia

Defining the Internet architecture for learning

AICC

ADL Model for Standards Evolution

Vision:

www.adlnet.org

Provide access to the highest quality education and training, tailored to individual needs, delivered cost-effectivly, anywhere and anytime.

Importance of SCORM?

	Current LMS	Future LMS
• Army (ATSC/TRADOC)	Click2Learn	? Under study
• Navy (CNET)	THINQ	THINQ
• Air Force	Plateau, Meridian KSI	? Under study
• Marines	Self Developed	THINQ
• DAU	Self Developed (OSS)	Atlas Pro
• USDA Grad School	None	? Under study
• IRS	None	Plateau
• CDC	Self Developed	? Under study
• NDU	Blackboard	Blackboard
• OPM	GeoLearning	GeoLearning

Vision: www.adlnet.org

Provide access to the highest quality education and training, tailored to individual needs, delivered cost-effectivly, anywhere and anytime.

Plugfest Participants
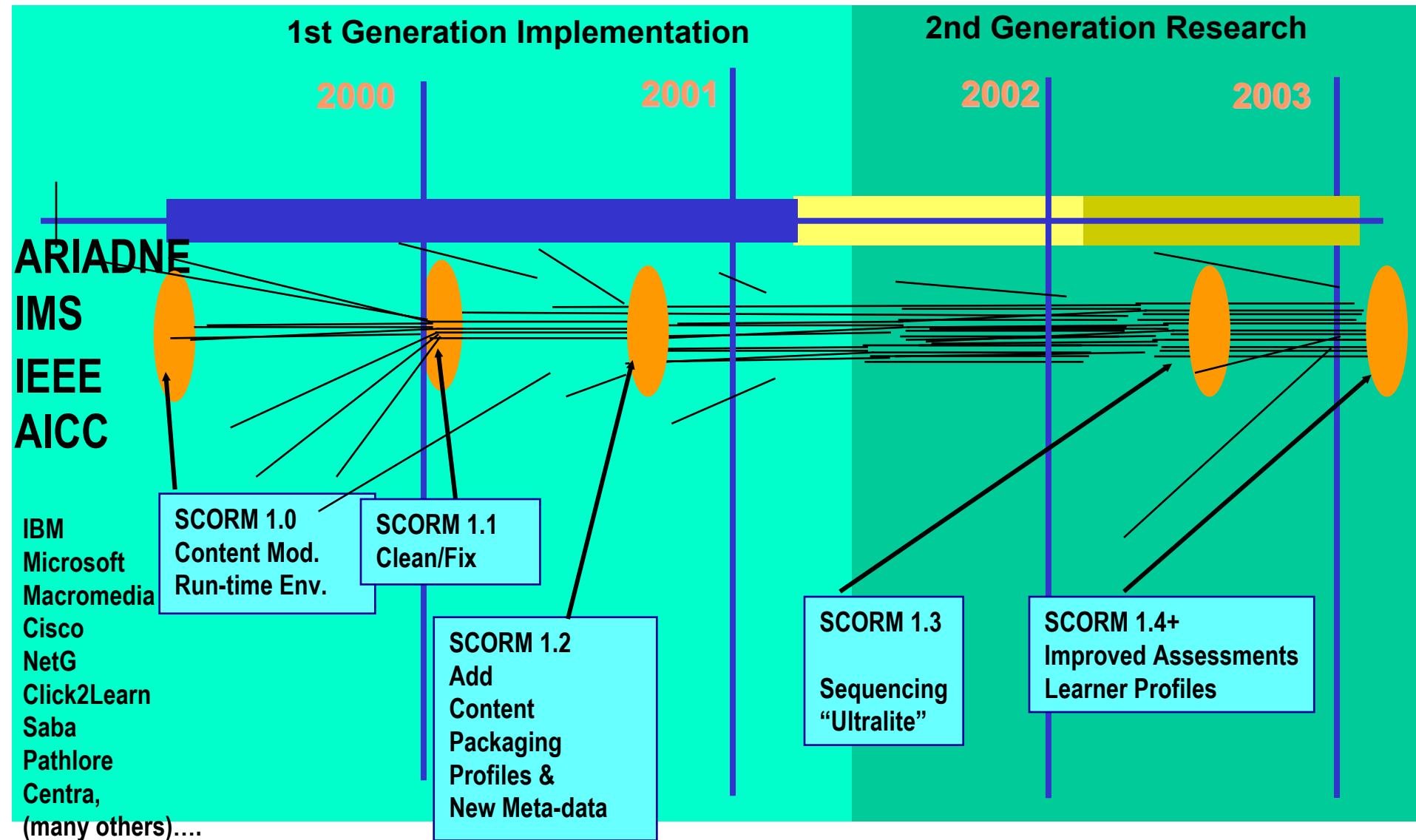
Vision:

www.adlnet.org

Provide access to the highest quality education and training, tailored to individual needs, delivered cost-effectivly, anywhere and anytime.

SCORM Testing Center POCs

- **Virginia Mesenbrink**

  Naval Undersea Warfare Center, Division Keyport

  phone: 360-315-7529

  email: mesenbrink@kpt.nuwc.navy.mil

- **Judy Brown**

  University of Wisconsin System

  phone: 608-263-9270

  email: certify@academiccolab.org

Vision: www.adlnet.org

Provide access to the highest quality education and training, tailored to individual needs, delivered cost-effectivly, anywhere and anytime.
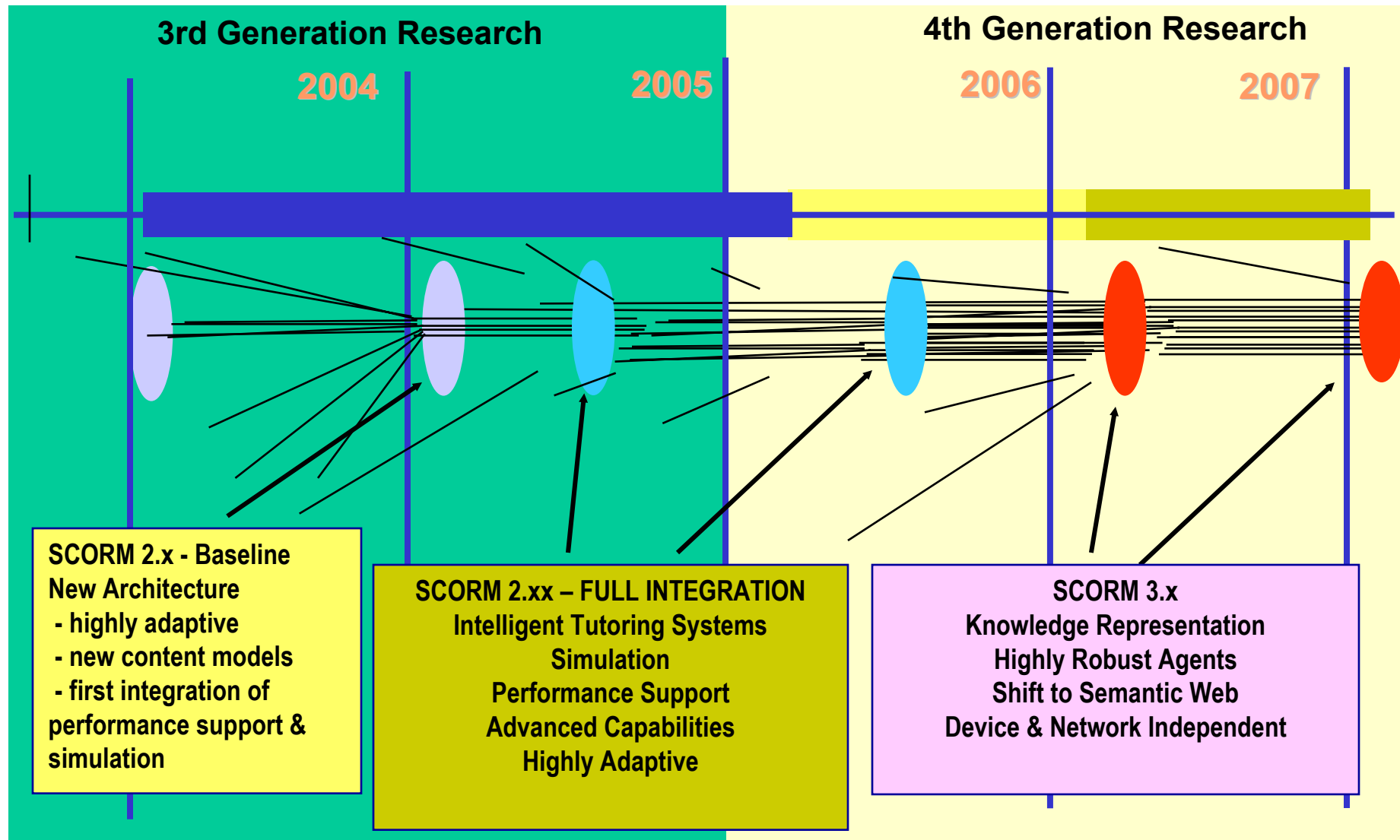
ADL Future Versions of SCORM

ADL Future Versions of SCORM

3rd Generation Research

4th Generation Research

2004   2005   2006   2007

SCORM 2.x - Baseline
New Architecture
- highly adaptive
- new content models
- first integration of
performance support &
simulation

SCORM 2.xx – FULL INTEGRATION
Intelligent Tutoring Systems
Simulation
Performance Support
Advanced Capabilities
Highly Adaptive

SCORM 3.x
Knowledge Representation
Highly Robust Agents
Shift to Semantic Web
Device & Network Independent

Additional Resources

- Available at www.adlnet.org

- Conformance Test Suite

- Sample Run-Time Environment

- Example content

- SCORM Adopters

Vision:

www.adlnet.org

Provide access to the highest quality education and training, tailored to individual needs, delivered cost-effectivly, anywhere and anytime.